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(54) Title: METHOD AND APPARATUS FOR DELIVERING DIGITAL CONTENT USING AN INTERNET APPLIANCE

(57) Abstract: An easy-to-use dedicated appliance allows consumers to legally download digital content from the Internet or other network. One variation of the appliance is designed to serve as a component in a stereo system, providing a consumer with the ability to select, download and play digital music from the Internet or other network even if the consumer does not have a computer. The appliance can download music and other digital content in an encrypted format; output music to other stereo components for real-time listening; and output the content to other specialized memory devices for use in portable players and in other devices such as electronic book readers. Users can select music using a display on the appliance or, alternatively, from a personal computer. A subscription content service method includes steps of storing digital content at a central location; retrieving selections made by consumers interested in playing selected songs or other units of the content; encrypting and transmitting the selected digital content to the consumer over the Internet; and performing the digital content at the consumer's location using an Internet appliance that is configured as a stereo component, including a stereo component which is physically housed in a personal computer. Each consumer pays a fee on a monthly or other periodic basis in exchange for having access to a large library of digital content, and may also purchase additional content on a fee-for-use basis.

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# METHOD AND APPARATUS FOR DELIVERING DIGITAL CONTENT USING AN INTERNET APPLIANCE

## TECHNICAL FIELD

The present invention relates generally to the transmission of digital music and other copyrighted digital content. More particularly, the invention provides a method and apparatus that allows consumers to subscribe to digital music programming and to receive such programming and other copyrighted digital content using an Internet appliance.

## BACKGROUND OF THE INVENTION

The music industry today faces several market factors that will force changes in the way it operates. The Internet is collapsing the supply chain in a broad range of businesses, and can be expected to pressure the music industry to do the same. In particular: (1) music is ideally suited to distribution over a digital network; (2) the uncompensated copying and distribution of music now occurring (e.g., Napster and MP3 copying) presents a significant challenge to the business model of the music industry; (3) the history of the software industry suggests that a solution to the intellectual property problems presented by this copying is to make the legal acquisition of music so convenient and inexpensive that there is little incentive to acquire it illegally, rather than relying on arcane and consumer-hostile encryption schemes; (4) broadband digital access is growing rapidly, with many well-capitalized companies competing to provide broadband access to the home; and (5) the demographics of frequent music purchasers is young and relatively stable, and music producers need to better access the age 35+ population to maximize their growth.

While consumers have always been able to purchase music on CDs and other media, the expense and trouble of compiling a desirable library of musical selections hinders the ability of the average person enjoy more music. Many consumers instead listen to radio broadcasts, which require listening to advertisements, and which offer songs selected by technicians (e.g., disk jockeys) rather than user-specified selections. Various forms of streaming audio are offered or will likely be offered by cable and satellite systems, and while various channels of this audio are dedicated to specific music genres, none offers the consumer the ability to specifically select the individual songs to

be played. A large untapped market exists in bringing together customers who want commercial-free music and entities that are willing to sell music quickly, inexpensively, and on demand.

The illegal copying of music over the Internet, while subjecting participants to potential criminal liability, illustrates the mass appeal of cheap, instant access to music and other digital content. The demand for such easily distributed digital content could be better satisfied by providing an authorized distribution system that is cheap and easy to use.

Prior art systems have attempted to provide individualized music selections "on demand." For example, U.S. Patent No. 5,931,901, entitled "Programmed Music on Demand from the Internet," describes a system that delivers music, along with advertising, to subscribers over the Internet. Each subscriber receives music selections with embedded advertising for display and playback on a personal computer. The music is delivered in digital form, and may be encrypted. This system, however, suffers from many disadvantages. Like broadcast radio and television, subscribers must tolerate advertising in exchange for receiving free musical selections. Moreover, each subscriber must use a relatively expensive and cumbersome computer to receive and play the music. Finally, the system uses personal data such as age, education, and income to target the advertisements, thus compromising privacy.

Another system, described in U.S. Patent No. 5,959,945 (entitled "System for Selectively Distributing Music to a Plurality of Jukeboxes"), relates to a method of transmitting encrypted digital music to specialized jukeboxes that use a statistical replacement algorithm to determine what songs should be downloaded into each jukebox. Music can be transmitted from a central storage location to one or more regional service centers, and thereafter to individual jukeboxes. So-called "monetary certificates" are used to authorize payment for individual songs in each jukebox. Another system is exemplified by U.S. Patent No. 5,819,160 ("Programmable Radio Subscription System for Receiving Selectively Defined Information").

Yet another system, described in U.S. Patent No. 6,055,566 ("Customizable Media Player with Online/Offline Capabilities"), provides an information delivery system that allows text documents to be downloaded from the Internet into a playback unit,

which then converts the text into audio using a text-to-speech system. The playback device must be connected to a personal computer, which in turn connects to the Internet to retrieve user-selected documents.

Conventional cable television and satellite systems have also been augmented over the years to provide access to radio stations and other pre-programmed music selections. Such programming is sometimes provided as part of a cable TV or satellite subscription package, allowing users to listen to music on one or more channels. Some systems allow users to listen to music on demand by transmitting the music over unused bandwidth on cable television channels. See, e.g., U.S. Patent No. 4,788,675 ("Music Delivery System"), which describes a system that relies on availability of channel bandwidth to transmit user-selected music and requires a complex frequency multiplexing scheme to transmit a limited number of signals on a given cable network.

None of the aforementioned systems solves the problems addressed by the present invention; that is, the provision of an inexpensive and dedicated appliance that permits subscribers to receive digital content on demand for immediate playback using a stereo system.

## SUMMARY OF THE INVENTION

According to one aspect of the invention, an inexpensive and easy-to-use dedicated Internet appliance, designed to serve as a component in a stereo system, provides consumers with the ability to select and download digital content, such as music, from the Internet or other network. The appliance has the capacity to download music and other digital content in an encrypted format, to output music to other stereo components for real-time listening, and to output the content to other specialized memory devices for use in portable players and in other devices such as electronic book readers. In one embodiment, the appliance includes a display through which musical selections can be made and scheduled.

According to another aspect of the invention, a subscription content service method includes steps of storing digital content at a central location; retrieving selections made by consumers interested in playing selected songs or other units of the content; encrypting and transmitting the selected digital content to the consumer over the Internet; and performing the digital content at the consumer's location using an Internet appliance

that is configured as a stereo component. In one variation of this method, each consumer pays a fixed fee on a monthly or other periodic basis in exchange for having access to a large library of digital content. In certain embodiments, a multi-tiered subscription service can be provided.

According to yet another aspect of the invention, the appliance can be used to retrieve user-selected music from a communication network such as the Internet, a cable communication system, or an RF communication system, wherein the music can be easily selected and played by the user.

These and other advantages will become apparent through the following detailed description, the figures, and the claims.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a plan view of an appliance constructed according to one variation of the invention.

FIG. 2 shows a schematic view of an appliance constructed according to one variation of the invention.

FIG. 2A shows a schematic view of an appliance according to another variation of the invention.

FIG. 3 shows a stereo system employing an appliance 301 according to one variation of the invention.

FIG. 3A shows a stereo system employing an appliance 360 according to another variation of the invention.

FIG. 4 shows a digital content distribution system according to one variation of the invention.

FIG. 5 shows steps that can be carried out to implement one method according to the present invention.

FIG. 6 shows one possible hierarchical menu-driven system that can be used to select music from a database of available selections.

## DETAILED DESCRIPTION OF THE INVENTION

FIG. 1 shows a plan view of an Internet appliance according to one embodiment of the invention. The term "Internet appliance" should be understood to refer to a special-purpose appliance that connects to the Internet to perform part of its function, and

not to a general-purpose computer. In one embodiment, such an appliance can be incorporated as a separate hardware unit into a general-purpose computer that shares the computer's display and input functions. It is preferred that the Internet appliance be designed as a specialized unit compatible with existing stereo components such as amplifiers, tuners, and CD players. For example, the Internet appliance is preferably a dedicated, non-general purpose component (e.g., it includes an embedded computer system) that performs only functions relating to the subscription and reception of digital content such as music. It differs from a typical general purpose personal computer connected to the Internet in that it automatically loads and runs a program to accomplish this special purpose without user intervention or choice, and it is not used to run general-purpose computer software applications such as computer games, spreadsheets, and the like. The appliance as shown in FIG. 1 can be operated even if the consumer does not have a personal computer.

In contrast to personal computers, which may not be located near a high-fidelity stereo system, the Internet appliance in one embodiment is preferably constructed of a size and shape such that it can be placed into a stereo rack or placed on top of another existing stereo component and connected using conventional audio jacks. As a dedicated Internet appliance, its costs can be minimized since it performs a limited set of functions, has a display that is smaller than conventional computer monitors, and need not connect to multiple peripherals of different types. Moreover, because it is compatible with existing stereo components, it provides a means for performing digital content using high-fidelity equipment. In short, it can be sold in electronics stores (or provided in conjunction with the user's subscription for digital content) as a stereo component with ready-to-play music downloaded from the Internet. It is within the scope of the invention, however, to permit the appliance to be connected to a personal computer to perform functions such as content selection (e.g., using a larger computer display) or copying of digital content. It is further within the scope of the invention to incorporate the appliance within a computer (e.g., as a computer board) that performs the functions of the appliance and utilizes the PC for control of the internal appliance.

As shown in FIG. 1, in one embodiment the unit includes a display 101 such as an LCD or LED panel on which a plurality of musical choices and selections can be

displayed. A cursor 102 can be used to indicate a pending selection on display 101. Display 101 need not be physically attached to the appliance, but could instead be incorporated into a remote control device that communicates with the appliance using an infrared, RF, or other communication link. Moreover, as described in more detail below, the display can be implemented as part of an existing personal computer display.

In one embodiment, display 101 can be used to display three different types of information: (1) catalog information showing available content (e.g., songs) listed by artist, musical category, author, or the like; (2) a list of content already selected by the user; and (3) hierarchical menus or pages that allow a user to navigate through a content selection process. Certain embodiments may display fewer than all of these three possible different types of information.

Cursor movement buttons 107 and 108 are manipulated to move cursor 102 through potential selections shown on the display 101. For example, assuming that display 101 shows the selections indicated in FIG. 1, the user can press button 107 to move the cursor up the list of choices or button 108 to move the cursor down the list. Only part of the list of potential choices need be shown at any one time, such that moving beyond the top or bottom of the displayed choices would cause the entire display to scroll up or down. Once the user has stopped on a desired selection, select key 103 can be pressed to indicate that the selection should be added to the list of selections. A cancel button 104 can be used to cancel a previously made choice. An information button 105 can be used to obtain more information for a given selection (e.g., the band performing the song, the conductor, history of the performers or musicians, and the like). Additional details concerning one possible hierarchical menu-driven approach for selecting digital content are provided herein. A numeric keypad 109 can also be used to enter choices by number from a catalog or from a numbered selection list shown on display 101.

Once the user has made one or more selections such as songs, narrated books, or other digital content, the user can press a "view selections" button 106 to show the selections on display 101. Other playback-type buttons such as play 110, stop 111, pause 112, forward/backward 113, and randomize 114 can be used to control the performance of songs or other works using the device. Downloading of the selected songs can begin immediately, such that playback occurs almost instantaneously upon selection. Some or

all of the selections can be downloaded at the same time, or content selections can be downloaded at the time they are ready to be played (e.g., as the list of selections is traversed). Assuming a good quality broadband connection of suitable bandwidth, the amount of time required to download a single song is negligible. In this respect, the Internet appliance of the present invention can be thought of as a massive CD player with an almost infinite variety of disks always available. Alternatively, content can be selected for playback at a later time, which can be user-specified.

It will be appreciated that different design choices can be made regarding the types of buttons, displays, and arrangements from those depicted in FIG. 1 without departing from the scope of the invention. Instead of the dedicated key scheme shown in FIG. 1, a touch-sensitive display screen could of course be used. In yet another embodiment, a personal digital assistant (PDA) such as a Palm Pilot™ or other device could be used to make content selections, and the selections could then be transmitted to the appliance 101 through an infrared port or the like.

FIG. 2 shows a schematic view of an Internet appliance according to one embodiment of the present invention. As shown in FIG. 2, the Internet appliance 200 includes a modem or other network interface 201 to connect the device to the Internet 212 or other network through a port or terminal 211. In one embodiment, a broadband connection to an Internet service provider can be used (e.g., DSL, ISDN, cable modem, or other connection). It will be appreciated that connection to the Internet can be via wireless connection, such as RF transmission.

Appliance 200 also includes a CPU 202 (e.g., a microcontroller or other suitable processing device such as a commercially available microprocessor) including software that that controls the functions associated with the device. The term "special-purpose processor" will be used to refer to a processor that is programmed with software that performs functions that are specific to the Internet appliance in order to distinguish it from general-purpose computers that can be easily reprogrammed by a consumer (e.g., a personal computer). These functions may include (but need not include) buffering, storing, decrypting and playing the music; managing the selection of music choices from the available recordings; and communicating with the music servers to request recordings and report usage.

A buffer storage area or memory 203 stores downloaded music or other content, and optionally stores frequently-requested selections in the device itself. Storage area 203 may comprise nonvolatile RAM or other storage device whose size can be selected based on cost and other design factors. Digital content can be stored in encrypted or unencrypted format as design dictates. Although in one embodiment an individual work (e.g., a complete song) is stored in the memory 203, it is entirely within the scope of the invention to store only parts of a work. It is also within the scope of the invention to only temporarily store all or parts of a work in the memory, such that content is downloaded and played in real time, and parts of the content reside only temporarily in the memory until it is played back for the user.

Display 210 may comprise a CRT, LCD or LED flat panel screen of a size sufficient to display content selections and permit a user to navigate through a content selection process. In one variation, the display comprises an active-matrix TFT display unit of the type found on notebook computers or personal digital assistants. In addition to text, graphics and color can be used to enhance the selection and control process. It may also be desirable to display web pages on display 210 in conjunction with the content selection and control process.

An input device 209 may comprise separate dedicated keys (see FIG. 1); a numeric keypad; a touch-sensitive display; a keyboard, or other suitable input devices to allow the user to control and interact with the device. In one embodiment, the input device is a touch-sensitive screen integrated with the display unit such that functions and digital content are selected using a fingertip or stylus.

In one embodiment, the Internet appliance includes a decompression and/or decryption processor 204, which may be functionally included as part of CPU 202 (e.g., software-implemented), or it may be a dedicated special-purpose chip. If digital content is compressed and encrypted before it is transmitted to the appliance, processor 204 decompresses and decrypts the encrypted content and generates "clear text" content that is converted to analog in D/A converter 205 and output from the appliance through a stereo jack 207. Transmission of compressed content, encrypted content, or both (e.g., compressed and encrypted) are within the scope of the invention.

Any of various encryption and/or compression schemes may be used. In one variation, each appliance is assigned a unique serial number that is stored in a fixed memory location or register 216. Alternatively, the unique serial number can be supplied by the server. The unique serial number is used by certain encryption schemes to uniquely identify the appliance.

Encryption may be performed using any commercially available scheme (e.g., public/private key approaches, see e.g., U.S. Patent No. 5,959,945). Compression may be optionally used to compress and decompress digital content (e.g., MP3 format). It will be appreciated that some or all of the components shown in FIG. 2 can be implemented using one or more application-specific integrated circuits (ASICs), and the inventive principles can be practiced using different components from those illustrated.

In one embodiment, selected content can be copied and stored onto a portable media 213 through a digital port 208 and digital driver interface 206. The content can be stored in either encrypted or unencrypted form. Various media such as the Sony® "memory stick" can be used to store content for later replay in a different device. Alternatively, a writable CD drive can be provided in order to store music on CDs. A digital output capability can also be used to write to other digital devices. One major additional use would be for electronic books. As electronic readers become practical, there will be a need for a convenient and foolproof way to transfer encrypted text to them, and the Internet appliance device and its associated selection and download capability would be well suited to the task.

Although it is contemplated that Internet appliance 200 will generate analog audio stereo outputs at signal levels matched to that of conventional stereo equipment (e.g., through a stereo jack matched to an input of a conventional audio amplifier), it is within the scope of the invention to incorporate an amplifier 214 into the appliance that can amplify the sound and generate signal levels sufficient to directly drive one or more speakers 215.

FIG. 2A shows a schematic view of an Internet appliance according to a second embodiment of the present invention. As shown in FIG. 2A, a subset of the components of the stand-alone version of the appliance (FIG. 2) are incorporated into a circuit board 201A connected to the internal bus 207A of a personal computer 200A. In this

embodiment, a personal computer is connected to a network (e.g., the Internet 212A) through a network interface 204A, such as a modem. The PC includes previously loaded device driver software 202A which interfaces with and controls the Internet appliance 201A, and which is processed by the computer's CPU and memory 203A. The control functions that in the standalone appliance are performed by a special-purpose processor can in this embodiment be controlled by the PC. These functions include (but need not include) buffering and storing the content, and interacting with the server to select content for downloading and authenticating the user. The device driver software communicates with the Internet appliance through the computer's internal interface bus 207A.

The Internet appliance device itself contains control circuitry and logic 206A (e.g., a microprocessor) to enable it to communicate with the device driver software in the PC. When compressed and/or encrypted material acquired from the servers on the communications network is passed to the appliance under control of the device driver software, it is then passed to decompression circuitry 215A and decryption circuitry 208A and 217A, not necessarily in that order, and the "plain text" version of the material is passed to the D/A converter 209A for conversion to analog signals suitable for outputting via a connector jack 210A to an external amplifier and speakers 216A. As with the embodiment as a separate external appliance, any of various encryption and decompression schemes may be used. Decompression and decryption circuits 215A and 208A can be implemented in software executing on a microprocessor, including for example a microprocessor that implements control logic 206A.

The Internal appliance may also include the ability to pass the decompressed and optionally decrypted content back to the device driver in the PC for outputting through one of the PC's standard digital interface systems 205A, typically a USB port, to external storage devices and or players 214A.

FIG. 3 shows a stereo system incorporating an appliance 301 according to one aspect of the present invention. As shown in FIG. 3, a conventional receiver/amplifier 302 drives two stereo speakers 305 and 306, and receives a radio signal through an antenna ANT. As is conventional, receiver/amplifier 302 includes one or more auxiliary input jacks that can accept audio signals from other devices such as CD players, tape decks, and the like. In accordance with the invention, appliance 301 receives musical

selections from a network connection 304, converts these selections into an analog signal that is compatible with existing receiver/amplifier 302, and passes the analog music signal over cable 303 to receiver/amplifier 302. As shown in FIG. 3, appliance 301 can be coupled to existing stereo equipment, thus providing a convenient and inexpensive way of downloading and playing music and other selections from the Internet or other communication networks using high-fidelity equipment.

FIG. 3A shows an appliance 360 according to another embodiment of the invention. In the embodiment shown in FIG. 3A, the appliance 360 downloads and plays digital content such as music from a central server 395 using a first network connection 357. However, in contrast to the embodiment of FIG. 3, the user interface functions and downloading commands are implemented in a general-purpose computer such as a notebook computer 350, which includes a separate connection (real or virtual) 355 to the network in order to carry out the music selection process. According to one variation of this embodiment, the appliance includes a minimal number of user-controllable input devices (e.g., PLAY, STOP, and forward/backward buttons) to control the playing of the digital content. Alternatively, all control buttons (e.g., PLAY, STOP, etc.) can be implemented entirely in general-purpose computer 350, such that the computer is able to completely control the appliance through the network such as the Internet. In the latter variation of this embodiment, appliance 360 would contain few or no user-controllable mechanisms at all, other than a power switch. Consequently, the display and input devices (and accompanying program in CPU 202) would not be included in the appliance itself. As with the embodiment in FIG. 3, the output of the appliance 360 can be provided directly to speakers 385 and 387, or the output can be provided to an auxiliary or other input to other stereo components such as components 370, 380, or 390.

In the embodiment of FIG. 3A, the selection of content (and optional remote control of the appliance) is preferably performed in general-purpose computer 350 using well-known web page functions. These can include hierarchical web page displays that arrange digital content selections by artist, genre, and the like, and can include user-specified preferences (e.g., avoid certain artists; favorite artists, and the like).

A method according to the embodiment of FIG. 3A includes steps of (1) selecting digital content using a general-purpose computer 350; (2) transmitting commands from

the general-purpose computer over a communication network to a central server to download one or more units of the digital content; (3) downloading the selected one or more units of the digital content into a special-purpose appliance through the communication network; and (4) playing or otherwise performing the one or more units of digital content downloaded in step (3). As explained above, general-purpose computer 350 can optionally further transmit commands through the communication network to control the playback of the selected content, such as fast forwarding, playing, pausing, volume control, and the like.

FIG. 4 shows a digital content distribution system according to one variation of the invention. As shown in FIG. 4, components can be connected into a system at three potentially different locations including a consumer location 401, a regional location 402, and a central location 403. Central location 403 includes a master music database 409 that contains a complete set of master recordings of the music and other downloadable items. User database 410 contains a master database of users and their selections. Central server 408 includes royalty calculation software 408A which, in certain embodiments, keeps track of each selection that has been selected by a user. Royalty calculation software 408A accumulates and reports to digital content owners (e.g., musicians, producers, authors, etc.) and the royalties owed them.

As shown in FIG. 4, one or more regional locations 402 can be connected to central location 403 through a communication link such as satellite, cable, the Internet, or other means. Each regional location 402 includes a regional server 406, typically located on the premises of a broadband provider. Regional server 406 can access regional databases 407, which contain duplicate recordings for the subset of the catalog music and other items which are expected to generate the largest number of requests. Server 406 may also include a buffering system to enable music downloaded on demand from the central server to be retained locally for a period of time and purged based on the actual or expected usage of the music at that location. Regional databases 407 may also include a database of local users and their selections for uploading on a periodic basis to the central server; information as to what recordings are available; and an individually-customizable menu system to enable each appliance to interact with the user for the purpose of selecting content and managing the system. Broadband service provider 405 may, for

example, comprise an Internet Service Provider or other service that permits the consumer to access the Internet. In one embodiment, digital content selections are stored as computer files and transferred over the Internet.

At each consumer's location 401, an Internet appliance 404 transmits requests for digital content over the Internet, receives content selections (preferably in encrypted and compressed format), and performs the selections at the consumer's location. A plurality of Internet appliances can be coupled through a single broadband service provider. The regional location is optional and the inventive principles can of course be practiced using equipment solely at a central location.

FIG. 5 shows steps for carrying out one variation of a method according to the invention. In step 501, the consumer activates the Internet appliance using a subscription service. This can be accomplished by, for example, plugging in the appliance to the Internet, whereby the appliance discovers that it has not yet been activated, contacts a known Internet address to obtain authorization, and checks to see whether a subscription has been authorized for the particular device. The consumer could pay for a subscription by calling a toll-free number; by logging onto a web site and providing payment by credit card; by mailing in a check; by subscribing at the point of sale for the appliance; or even by entering credit card information through the front panel of the appliance (see FIG. 1). After the central server 408 (FIG. 3) had verified payment and correlated the payment to a unique serial number stored in the appliance, the subscription authorization would begin, allowing the user to download music.

If a subscription account has lapsed for nonpayment, the servers would refuse to honor further requests for digital content, and an error message would be returned. Subscription accounts could also be set up using a "tiered" approach, such that certain users subscribe to premium services (e.g., more choices; "deeper" choices such as the same song performed by different groups; earlier access to newly released music, and the like). Moreover, billing could be accomplished in conjunction with a broadband service provider, such that the consumer is billed for the services as part of his or her Internet connection. It is contemplated that certain digital content can be billed on a "per use" basis, such that a separate charge is made above and beyond (or in the alternative to) the normal subscription fees.

In step 502, the user selects one or more units of digital content, such as a song, an album of songs, a narrated book, or the like. In step 503, the system transmits the selected content to the Internet appliance, preferably in encrypted form. (Provisions for encryption keys could be handled at the time the subscription is activated). In step 504, the digital content is decrypted in the appliance, and in step 505 is performed or played for the user. In step 506, the information required to compute royalties due to the performer or artist as a result of the performance or copying are calculated and stored for later accounting purposes.

One form of the music selection component of the appliance uses a series of hierarchical menus, which can be presented either on a touch screen or similar device incorporated in the appliance, or as screens to be displayed by a browser running in a PC attached to the device. Such a hierarchical menu system could be implemented to look like the selection menu of a jukebox, generalized to include not only music selections but selections of additional screens, customized programs, and other services. The appliance could be connected to a general-purpose computer through a serial port or the like in order to display content selections on a larger display (e.g., a flat-panel display or a CRT). The following describes one possible selection process.

When the device is turned on, or when a "Home" selection is made anywhere, an initial screen is displayed. The initial screen (and all subsequent ones) may contain the following elements:

(a) Banners that identify the service providers, advertise, and so on.

(b) Text labels that are not associated with any action but serve to organize the screen.

(c) Selection labels (like juke box labels) that play a selection, or play a predefined group of selections, including an album or a user-defined mix of selections.

(d) Page labels that do not themselves play a selection but take the user to another page.

(e) Player control buttons such as play, pause, stop, next, previous, and randomize.

(f) Labels that cause actions such as the purchase of music and other ancillary functions.

According to one embodiment, the user navigates through the screens and makes selections. When it is desired to play, the appropriate control at the bottom of the screen is selected. The option also exists to randomize the playlist. When selections are playing, it is still possible to select menu items.

FIG. 6 shows one possible hierarchical menu-driven system that can be used to select music (merely one form of digital content) from a database of available selections. It will be apparent that many different techniques for navigating through a list of choices are possible. As shown in FIG. 6, a first page 601 prompts the user to select music by artist, genre, or previously selected favorites. If the user selects artist, then a menu 602 of available artists is displayed. Alternatively, the user could enter the name of the artist and the pertinent choices would be displayed. Upon selecting an artist, the songs available by that artist are displayed in a menu 606. Once selected, the user can "back out" to a previous menu or return to the base menu 601.

If the user had selected genre, then a different menu 603 displaying selections by genre would be displayed, and upon selecting a specific genre, the appropriate choices would be shown in a follow-on menu 605.

If the user had selected favorites, a menu showing previously selected songs would be displayed as in menu 604.

According to one variation of the invention, the user can specify a "not" option to prevent future menus from displaying a particular artist, genre, or song selection. For example, if the user dislikes a particular artist and is never likely to select a song by that artist, the user could select the artist and then select "not" indicator 607. Future menus would not show choices that the user had previously indicated as being a "not" selection.

In general, it is anticipated that customizable menus will be provided for each user, such that different users can see different menu choices (e.g., different favorite artists and the like). This information regarding menu differences could be stored in each Internet appliance, or it could be stored at one of the servers in the system (see FIG. 4). In one variation, each user could enter a user name or number, in order to inform the appliance of the menu preferences for that particular user. Thus, for example, in a single household with four residents (Mom, Dad, Son, and Daughter), each resident could use the same device yet be presented with different menu choices and preferences.

The selection apparatus can optionally take other forms including a keypad to enter a number from a catalog or an optical bar code reader to select from a catalog.

In one embodiment, the appliance could communicate over the network with a user's personal computer in order to make content selections. In this embodiment, the

user's computer would run a conventional Internet browser with a plug-in for the purpose of controlling the appliance. In this embodiment, in order to play music, the user would log on to a web site, and would have all the power of customized pages created by a central computer, high resolution displays, search engines, and so on at his/her command. For example:

(a) When the user (one of multiple users, e.g. Mom, Dad, Son, Daughter) opens the site, he is presented with a home page which can be customized by him (include/omit certain genres, include personal playlists, include certain artists, and so on and on) and which can be customized by the server (suggest similar material to that which has been suggested, suggest new artists, suggest seasonal music, special offers on downloads, and so on).

(b) The user selects music through a series of cascading menus in the conventional manner, either to build a play list or to simply play.

(c) The user can play, pause, stop, etc. from the browser.

(d) The central computer in turn communicates with the appliance and sends the proper digital content and commands to the appliance to control its actions in accordance with the choices made by the user at the browser.

It should be noted that the appliance itself can serve as a limited capability web server, and it is within the scope of this invention that it thereby be controlled directly (without the intervention of a central server) by a browser located on the user's personal computer connected by a network to the appliance.

Alternatively, the computer control described above could also be contained within the appliance. This could take the form of a CRT or flat panel display being physically integrated with the appliance, with a mouse-like selection mechanism, which could be either a touch-screen display or a touch-pad mouse. It would not be a general-purpose browser, but wired to connect automatically to the music home page. This display could be either full size or a miniature version, and the central server would know the display parameters and format pages appropriately. The display could be served with either the full-blown browser version for those comfortable with its complexity, or a simplified jukebox-like control panel for less-wired users, along the line of what was described above. There could also be simplified control at the appliance through a

keypad and/or lightpen, where the user enters a number or name corresponding to the selection.

The downloading process can be implemented using a tiered system approach as follows:

(1) The consumer, through one of the various techniques for selecting music, makes a choice of one or more passages of music (or other digital content) at the Internet appliance.

(2) The appliance checks to see whether that content is stored internally as a result of a previous download. If so, it is played, and notification of that fact is sent to the regional server.

(3) If the content is not stored locally, a request is sent over the broadband network to the regional server, which checks both its duplicate catalog and its storage buffer to see if the material is stored locally. If so, it is sent via the broadband connection to the appliance.

(4) If it is not stored at the regional level, a request for the music is sent upward to the master server, which transmits it back to the regional buffer storage and immediately thence to the appliance. Such music is retained in the buffer storage regionally until it is displaced by more-frequently requested content or its time-to-live expires.

(5) The consumer pays for access to this catalog of music through a subscription, or multiple subscriptions to various categories of music. The business model also allows for sell-through to the consumer of specific items on a fee basis. These items could include premium content, special services such as books-on-tape, and content for electronic book readers.

(6) An agreed-upon percentage of the subscription revenue is passed to the catalog owners, who distribute a portion of it according to their contractual arrangements regarding royalties, and keep the remainder.

In addition to playing digital content directly from the device, the principles of the invention can be applied to copy songs and other digital content. In other words, the device can be used to facilitate the legal downloading and copying of digital material while charging a specific fee and generating specific one-time royalties. This could be used with music, with books-on-tape, and ultimately with electronic books.

Material to be downloaded in this fashion can be selected through the established selection mechanism, and depending on the sales terms of the digital content, be provided in either encrypted or unencrypted form. The charge for such material can be made as an additional charge to the subscription rate, or in specific cases could be paid for with a credit card.

There are at least two methods of outputting such material. First, the device could incorporate a standard digital interface to the outside world, such as a Universal Serial Bus (USB) or IEEE 1394 bus port. Such a port could connect to a personal computer or to a device to specifically write a portable form of storage. For example, the Sony® portable MP3 player interfaces with the computer through USB; it could equally well do so with the appliance. The Sony® device is capable of playing both unencrypted MP3 files and a proprietary encrypted format. Depending on the device itself and the terms of sale, the material could be transferred in either encrypted or decrypted format. Likewise, a CD writer could be connected in this way, or the one in a personal computer connected via USB.

Second, as one or more universal standards for a portable memory device are developed, the appliance could optionally incorporate this specific interface. For example, in the case of the memory stick, the appliance could incorporate a slot on the front into which the memory stick was placed and subsequently programmed, and the memory stick could then be used to transport the material to a portable player, automobile radio, and the like.

It is within the scope of this invention that the appliance functions as a general interface to a variety of specialized playback devices. In this embodiment, content remains in an encrypted format, and a variety of playback devices (Walkman®-like, boom boxes, auto radios, and similar devices) would handle the encrypted music playback. This is similar to with the present handling of DVD movies; the material is on the disk in an encrypted format, and a variety of specific playback devices are licensed and suitably programmed to decrypt and play back the movies. The appliance would be the universal interface to the reservoir of content.

Royalties could be paid in at least three ways. First, for the general subscription-based content, the various intellectual property owners would get a defined percentage of

the revenues generated by the subscription, pro-rated by the specific content. (E.g., if the royalties are $10/month, the check for $10 would be accompanied by a breakdown of what percentage of the total time in use was spent with each specific piece of content. If one song only was played, that lucky right holder would get $10 for that single instance, if 100 were played, each song rights holder would get $.10.)

Second, as an option, the operator of the service could pay the copyright holders a contractually agreed-upon fee for each piece of content delivered, and the intermediary would absorb the business risk of how much content was delivered in a given period.

Third, for material sold for a specific fee, the rights holder would get a contractually agreed amount that is incorporated into the price to the consumer. (E. g., for the $3 purchase of a book-on-tape, the publisher gets $1).

The advantages of the foregoing system and method are numerous, and include the following:

(1) It provides a stepwise approach to digital distribution of music, collapsing the supply chain while retaining control of the distribution.

(2) It vastly simplifies the digital download process and makes it accessible to large numbers of people who are uncomfortable with or incapable of using a personal computer for the process.

(3) All content delivered in this format can be encrypted in its digital incarnation, thus protecting its integrity and preventing mass theft.

(4) It opens new markets to music companies without cannibalizing existing CD sales.

(5) It provides a mechanism to write new portable formats such as Sony®'s music stick memory, or to create CDs themselves in an appliance with that capability.

(6) As with on-line booksellers, it revitalizes the backlist of the music companies.

(7) It provides music companies with perfect information on the tastes, correlations and trends in consumer preferences, as each individual download is recorded.

The system and appliance can be generalized to become an Internet-based system which is specialized to handle in a controlled way digital copyrighted material (e.g. music, books-on-tape, books for electronic readers), thereby administering intellectual

property rights and providing a simple interface for users not familiar or comfortable with the complexity of a computer.

While the foregoing description ahs been provided in terms of two levels of computers above the ultimate consumer, the underlying hierarchical concept can logically utilize more or fewer than those two levels, with the economics of computer placement, communications costs, and performance determining the most effective design.

What has been described above is merely illustrative of the application of the principles of the present invention. Other arrangements and methods can be implemented by those skilled in the art without departing from the spirit and scope of the present invention. Any of the methods of the invention can be implemented in software that can be stored on computer disks or other computer-readable media for execution in a host or target computer. While an electrical medium has been described as the communications channel, the principles can also be applied using RF, fiber optic, or other media. Although the appliance has been described primarily with reference to delivery of content using the Internet, other communication networks including cable, radio frequency delivery, and the like are also within the scope of the invention. No claim should be interpreted to be in means plus function format. Numbered steps in method claims should not be interpreted to require a particular ordering of the steps.

## CLAIMS

1. A dedicated appliance that can download digital content through a communications network from a facility geographically separate from the dedicated appliance, comprising:

a display device that displays information concerning the digital content;

an input device that allows a user to select one or more units of the digital content;

a special-purpose processor that receives selections from the input device and that controls the display device to display the information concerning the digital content;

a network interface under control of the processor, wherein the network interface connects to the communications network and downloads the selected one or more units of the digital content;

a memory that stores the selected one or more units of the digital content downloaded from the communications network; and

an output terminal that outputs the selected one or more units of the digital content stored in the memory.

2. The dedicated appliance according to claim 1, wherein the display device displays information concerning available choices of music available for downloading into the dedicated appliance.

3. The dedicated appliance according to claim 2, wherein the display device displays information concerning available choices of music arranged in a hierarchical manner.

4. The dedicated appliance according to claim 2, wherein the display device displays information concerning available choices of music arranged by artist.

5. The dedicated appliance according to claim 2, wherein the display device displays information concerning available choices of music arranged by genre.

6. The dedicated appliance according to claim 2, wherein the display device displays information concerning available choices of music arranged differently depending on the identity of the user.

7. The dedicated appliance according to claim 2, wherein the display device displays choices on a list and highlights a currently selected choice.

8. The dedicated appliance according to claim 1, wherein the display device displays selections made by the user in response to manipulation of the input device.

9. The dedicated appliance according to claim 1, further comprising a digital-to-analog converter that converts digital music to analog form, and wherein the output terminal comprises a stereo output jack that provides an analog version of the digital music in a format suitable for playback on a stereo system.

10. The dedicated appliance according to claim 9, further comprising a decompression and decryption circuit that decompresses and decrypts the digital music prior to being converted to analog form.

11. The dedicated appliance according to claim 1, further comprising a digital output port that permits the selected one or more units of the digital content to be stored on a portable storage medium.

12. The dedicated appliance according to claim 1, wherein the network interface downloads the selected one or more units of the digital content from a regional digital content server that maintains copies of frequently requested content.

13. The dedicated appliance according to claim 1, wherein the digital content comprises a book.

14. The dedicated appliance according to claim 1, wherein the network interface downloads the selected one or more units of the digital content in accordance with a subscription fee service.

15. The dedicated appliance according to claim 1, wherein the network interface downloads the selected one or more units of the digital content in accordance with a fee-per-unit service.

16. A method of providing digital content over a communication network using a special-purpose appliance, comprising the steps of:

(1) subscribing to a digital content service that provides access to a database of digital content stored in a location geographically separated from the location of the appliance;

(2) selecting, using a user interface on the appliance, one or more of the digital content choices;

(3) downloading the one or more selected digital content choices into the appliance over the communication network in response to verifying that the subscription in step (1) is active; and

(4) playing the one or more selected digital content choices using a device suitable for the particular type of content.

17. The method according to claim 16, wherein step (2) comprises the step of selecting one or more digital content choices using display and input devices of a personal computer connected by a communications network to a remote server.

18. The method according to claim 16, wherein step (2) comprises the step of displaying on the appliance a list of choices of available content.

19. The method according to claim 18, wherein step (2) comprises the step of displaying the list of choices of available content in a hierarchical manner.

20. The method according to claim 18, wherein step (2) comprises the step of displaying a list of choices of music arranged by artist.

21. The method according to claim 18, wherein step (2) comprises the step of displaying a list of choices of music arranged by genre.

22. The method according to claim 18, wherein step (2) comprises the step of displaying a different list of choices depending on the identity of a user operating the special-purpose appliance.

23. The method according to claim 18, further comprising the step of displaying a list of choices including a highlighted choice corresponding to a currently selected choice.

24. The method according to claim 16, wherein step (2) comprises the step of displaying selections made by a user in response to manipulation of the special-purpose interface.

25. The method according to claim 16, wherein step (3) comprises the step of downloading digital music, and wherein step (4) comprises the step of converting the digital music into analog form and playing the analog music on a stereo system through a stereo jack on the special-purpose appliance.

26. The method according to claim 25, further comprising the step of decompressing and decrypting the digital music before playing the analog music on the stereo system.

27. The method according to claim 16, further comprising the step of storing the digital content on a portable storage medium.

28. The method according to claim 16, wherein step (3) comprises the step of downloading the digital content from a regional digital content server that maintains copies of frequently requested content.

29. The method according to claim 16, wherein step (3) comprises the step of downloading a book, and wherein step (4) comprises the step of using an electronic book reader.

30. The method according to claim 16, further comprising the step of calculating a royalty based on the downloaded one or more selected digital content choices.

31. A system for providing subscription-based digital content, comprising:

a master database comprising digital content;

a user database comprising information concerning a plurality of subscribers;

a central computer server which, in response to a request to download a unit of digital content, checks the user database to confirm that a request is authorized by subscription and, in response to the confirmation, retrieves the requested unit of digital content; and

a plurality of special-purpose Internet appliances coupled to the central computer through a broadband service provider, wherein each Internet appliance allows a user to select one or more units of the digital content, download the selected one or more units of the digital content from the master database through the central computer, and output the selected one or more units of digital content.

32. The system of claim 31, wherein the subscription-based digital content comprises digital music or other audio content that is downloaded in compressed and encrypted format.

33. The system of claim 32, wherein each Internet appliance generates an analog audio output that is compatible with conventional stereo systems.

34. The system of claim 31, wherein the subscription-based digital content comprises a book.

35. An appliance adapted to be coupled to a bus of a computer system, the computer system including a CPU, a memory, a network interface that connects to and

downloads digital content from a communications network, and a display device, wherein the appliance comprises:

control logic that communicates with the computer system to display and select digital content on the display device;

a decryption and decompression circuit that decrypts and decompresses digital content selected using the display device and downloaded through the network interface, and provides a digital output thereof;

a digital-to-analog converter that converts the digital output to analog form; and

an output jack that provides an analog output signal suitable for driving a stereo component.

36. The appliance of claim 35, wherein the digital content comprises digital music downloaded using a subscription content service.

37. A dedicated Internet appliance that downloads music in digital form through the Internet from a facility geographically separate from the dedicated Internet appliance, comprising:

a display device that displays information concerning the digital music including available choices of music available for downloading into the dedicated Internet appliance;

an input device that allows a user to select one or more units of the digital music;

a special-purpose processor that receives selections from the input device and that controls the display device to display the information concerning the digital music;

a modem under control of the special-purpose processor, wherein the modem connects to the Internet and downloads the selected one or more units of the digital music;

a memory that stores the selected one or more units of the digital music downloaded from the Internet;

a digital-to-analog converter that converts the selected one or more units of the digital music to analog form; and

a stereo output jack that outputs the selected one or more units of the digital music in analog form.

38. The dedicated Internet appliance of claim 37, further comprising circuits to decompress and decrypt compressed and encrypted digital music downloaded from the Internet.

39. The dedicated Internet appliance of claim 37, wherein the digital music is provided through a subscription service for a fee.

40. The dedicated Internet appliance of claim 37, wherein the display device displays information concerning musical choices arranged in a hierarchical manner.

41. A special-purpose appliance comprising:

a terminal adapted to be connected to a communication network;

a network interface coupled to the terminal, wherein the network interface downloads digital content selected from a general-purpose computer that is separate from the special-purpose appliance and that is separately coupled to the communication network;

a processor that controls the network interface to download digital content from the communication network in accordance with selections made using the general-purpose computer;

a memory that stores digital content downloaded from the communication network;

a digital-to-analog converter that converts the digital content stored in the memory into analog form; and

an output terminal that outputs the analog form of the digital content.

42. The special-purpose appliance of claim 41, further comprising a decryption and decompression circuit that decrypts and decompresses the digital content after it is downloaded from the communication network and before it is converted to analog form.

43. A system comprising the special-purpose appliance of claim 41 and a general-purpose computer programmed with software that allows a user to select digital content from a central server and to control the downloading and playing of the content in the special-purpose appliance.

44. A method of downloading digital content over a communication network, comprising the steps of:

(1) selecting digital content using a general-purpose computer that is coupled to the communication network;

(2) transmitting commands from the general-purpose computer through the communication network to a central server to download one or more units of the digital content into a special-purpose appliance that is separately coupled to the communication network;

(3) downloading the selected one or more units of the digital content into the special-purpose appliance through the communication network; and

(4) playing the one or more units of digital content downloaded in step (3).

45. The method of claim 44, further comprising the step of selectively controlling the playback of the one or more units of digital content from the general-purpose computer using commands that are transmitted over the communication network.

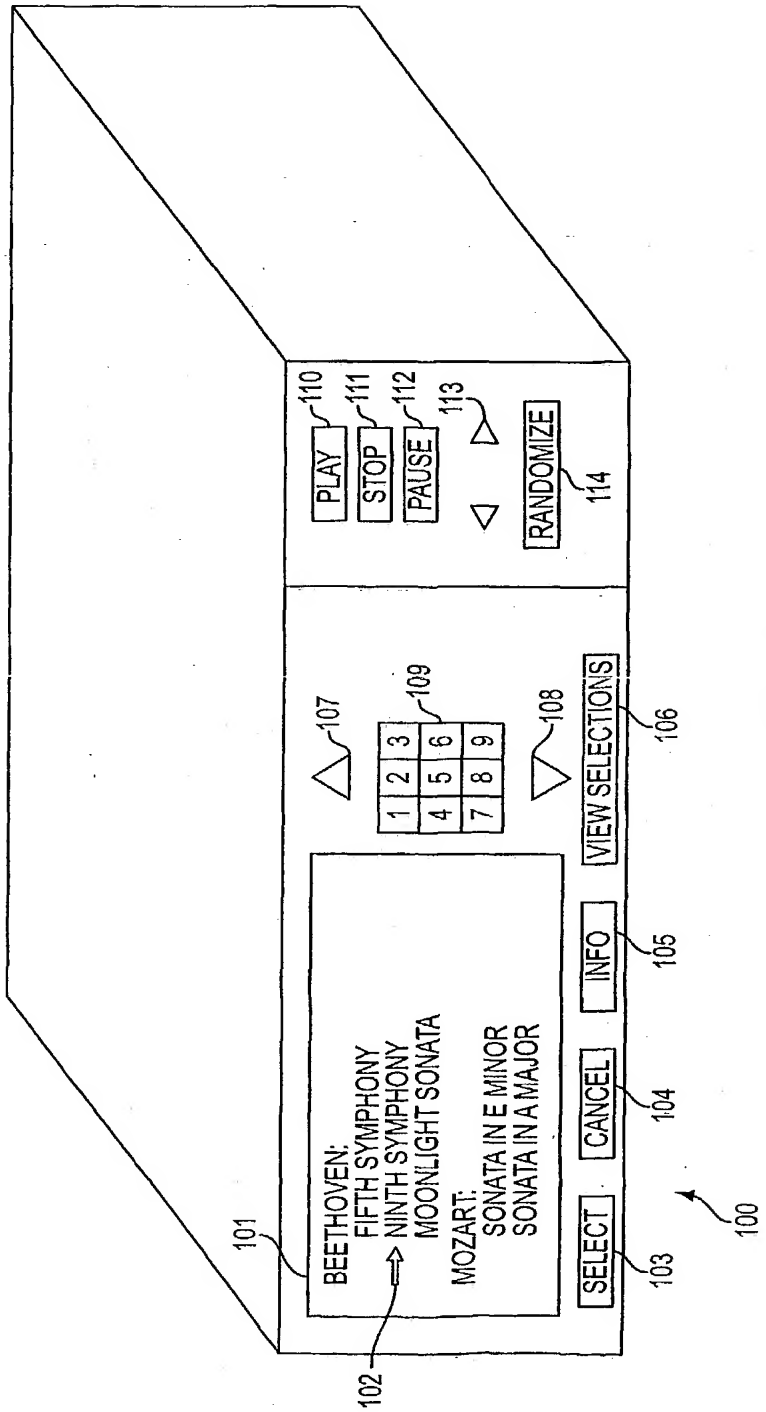
PLAY
STOP
PAUSE
RANDOMIZE
110
111
112
113
114
107
109
108
1 2 3
4 5 6
7 8 9
VIEW SELECTIONS
106
INFO
105
CANCEL
104
SELECT
103
100
101
BEETHOVEN:
FIFTH SYMPHONY
NINTH SYMPHONY
MOONLIGHT SONATA
MOZART:
SONATA IN E MINOR
SONATA IN A MAJOR
102

FIG. 1

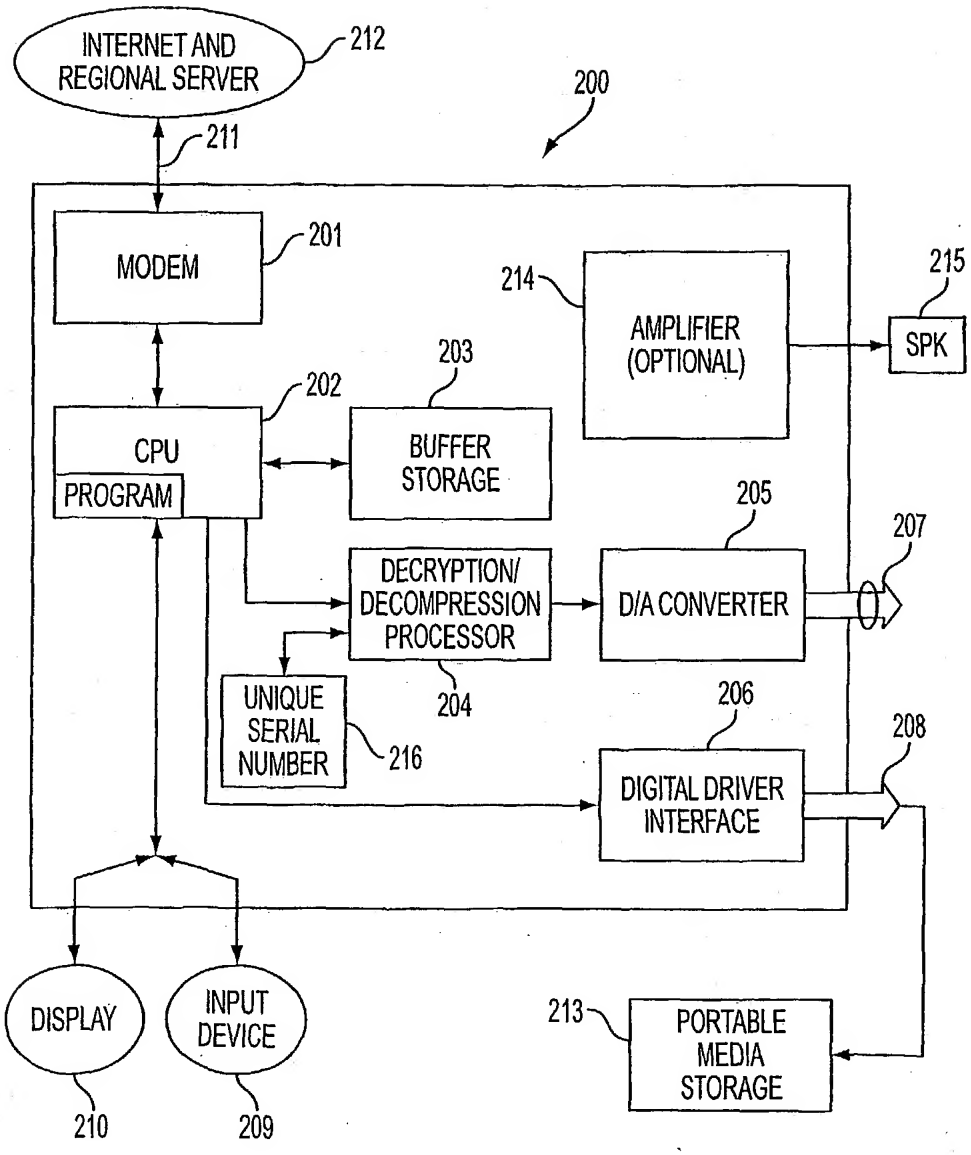
INTERNET AND REGIONAL SERVER
212
200
211
MODEM
201
214
AMPLIFIER (OPTIONAL)
215
SPK
203
202
CPU
PROGRAM
BUFFER STORAGE
205
207
DECRYPTION/ DECOMPRESSION PROCESSOR
D/A CONVERTER
UNIQUE SERIAL NUMBER
216
204
206
208
DIGITAL DRIVER INTERFACE
DISPLAY
INPUT DEVICE
213
PORTABLE MEDIA STORAGE
210
209

FIG. 2

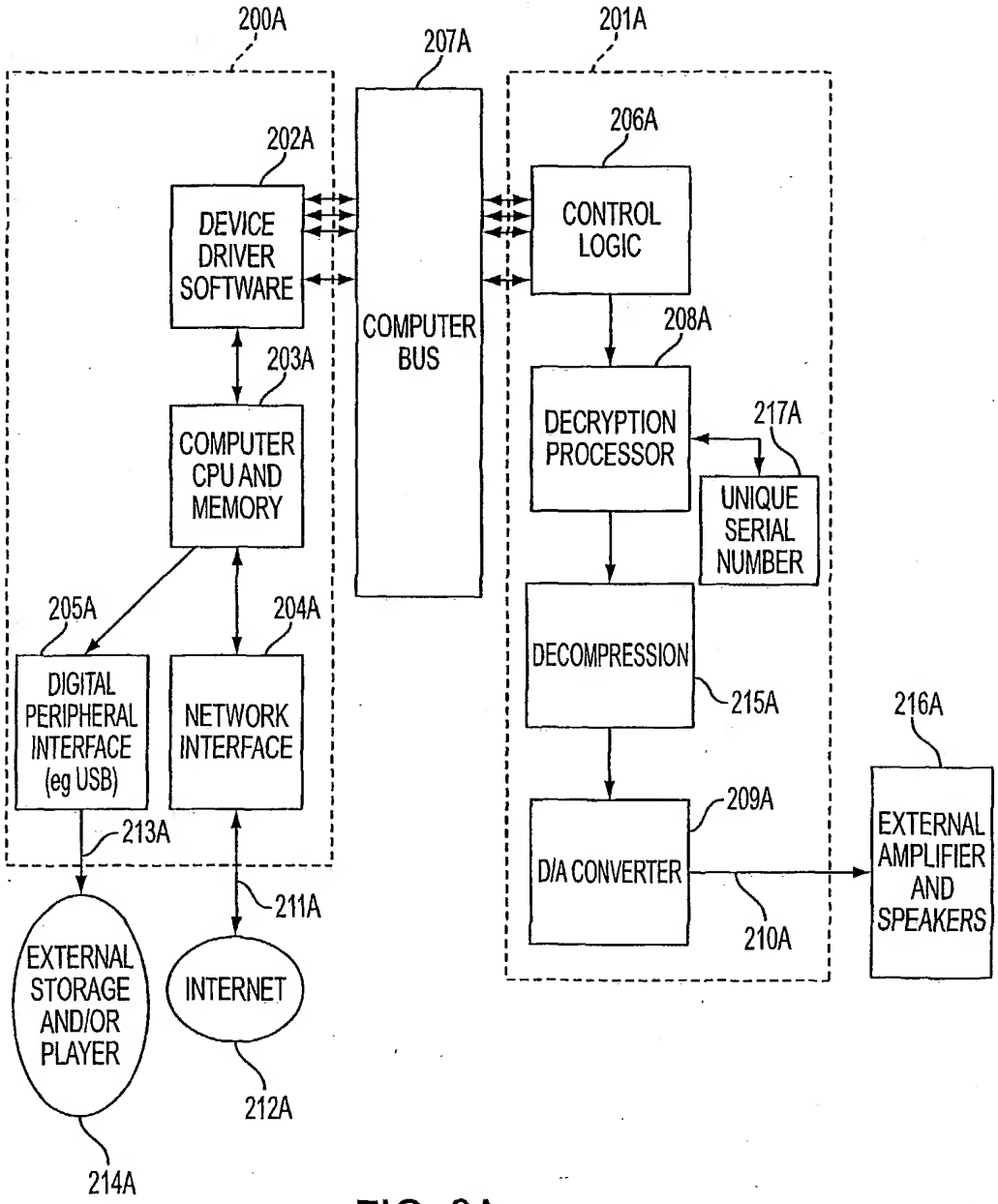
200A
207A
201A
202A
206A
DEVICE DRIVER SOFTWARE
COMPUTER BUS
CONTROL LOGIC
208A
203A
DECRYPTION PROCESSOR
217A
UNIQUE SERIAL NUMBER
COMPUTER CPU AND MEMORY
205A
204A
DECOMPRESSION
215A
216A
DIGITAL PERIPHERAL INTERFACE (eg USB)
NETWORK INTERFACE
209A
EXTERNAL AMPLIFIER AND SPEAKERS
213A
D/A CONVERTER
211A
210A
EXTERNAL STORAGE AND/OR PLAYER
INTERNET
212A
214A

FIG. 2A

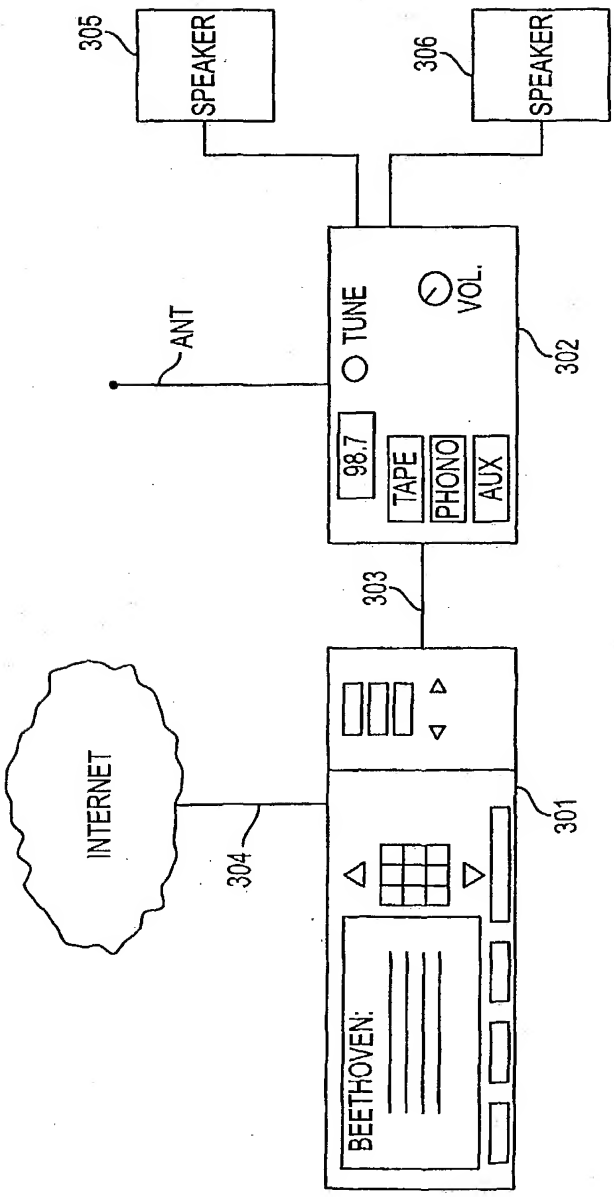
305
SPEAKER
306
SPEAKER
ANT
TUNE
VOL.
302
98.7
TAPE
PHONO
AUX
303
INTERNET
304
301
BEETHOVEN:

FIG. 3

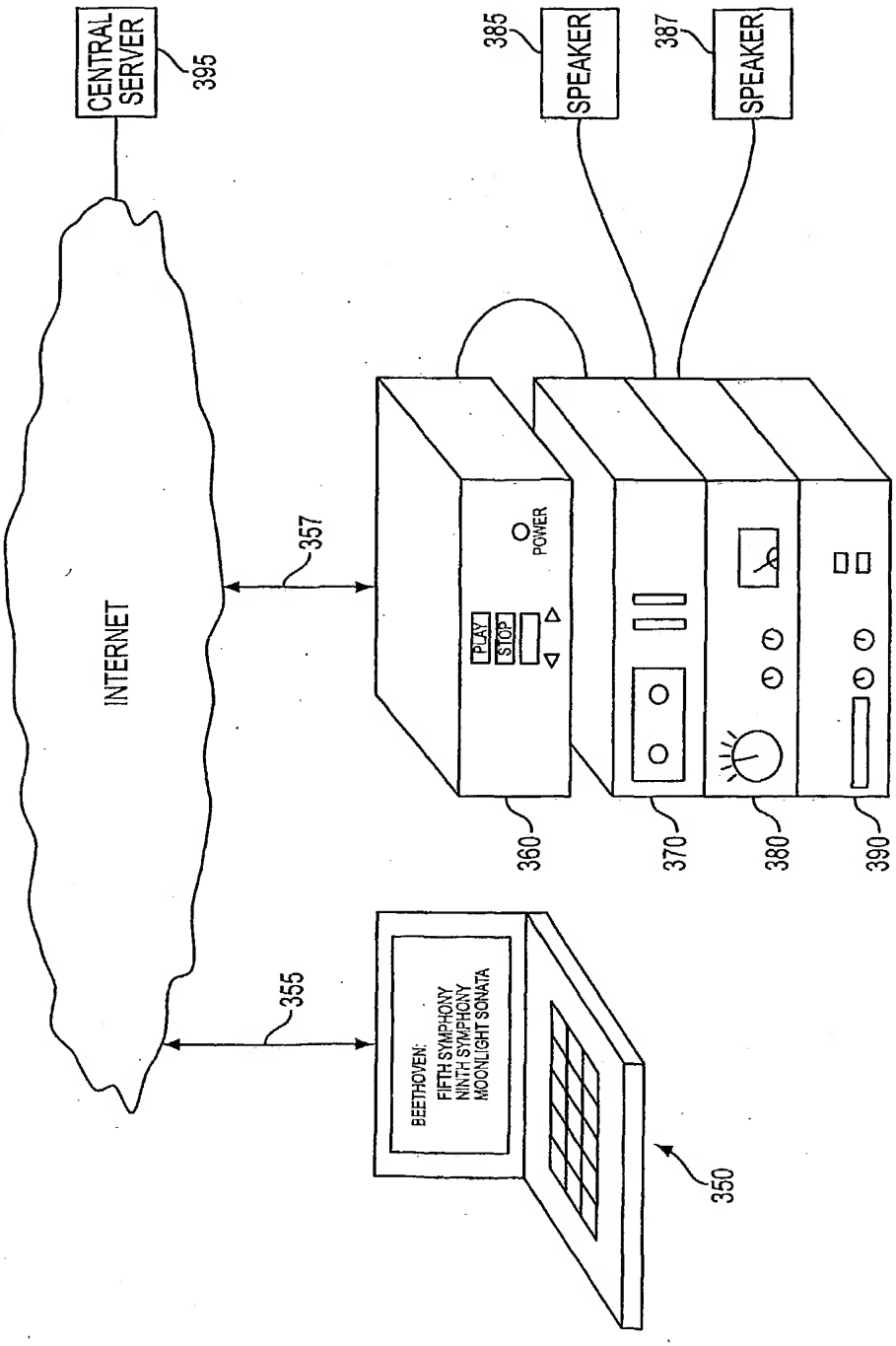
CENTRAL SERVER
395
385
SPEAKER
387
SPEAKER
INTERNET
357
POWER
PLAY
STOP
360
370
380
390
355
BEETHOVEN:
FIFTH SYMPHONY
NINTH SYMPHONY
MOONLIGHT SONATA
350

FIG. 3A

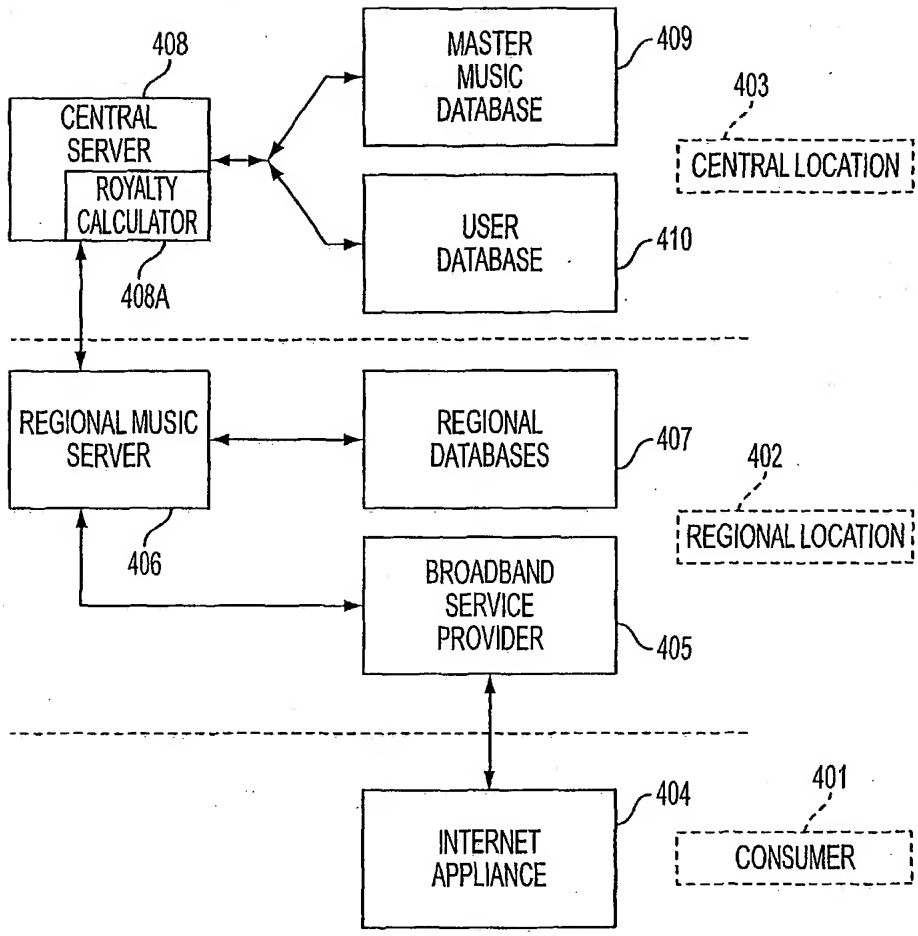
408
CENTRAL SERVER
ROYALTY CALCULATOR
408A
MASTER MUSIC DATABASE
409
403
CENTRAL LOCATION
USER DATABASE
410
REGIONAL MUSIC SERVER
406
REGIONAL DATABASES
407
402
REGIONAL LOCATION
BROADBAND SERVICE PROVIDER
405
INTERNET APPLIANCE
404
401
CONSUMER

FIG. 4

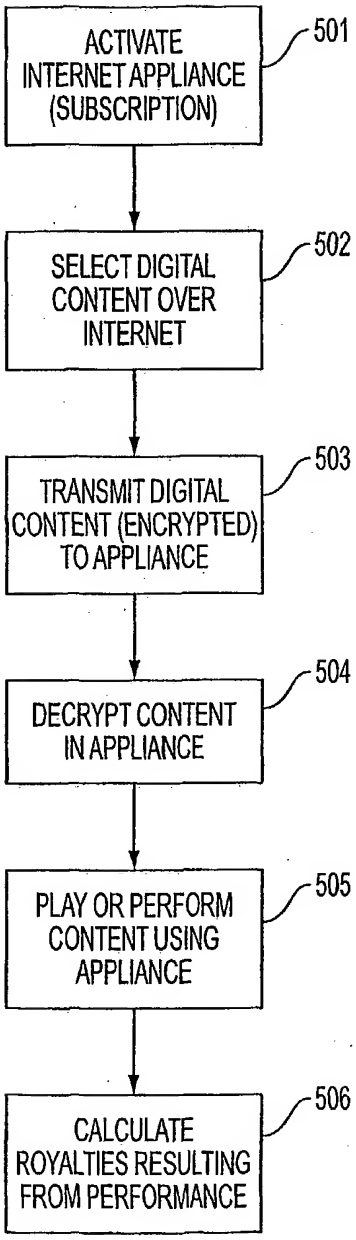
ACTIVATE INTERNET APPLIANCE (SUBSCRIPTION)
501
SELECT DIGITAL CONTENT OVER INTERNET
502
TRANSMIT DIGITAL CONTENT (ENCRYPTED) TO APPLIANCE
503
DECRYPT CONTENT IN APPLIANCE
504
PLAY OR PERFORM CONTENT USING APPLIANCE
505
CALCULATE ROYALTIES RESULTING FROM PERFORMANCE
506

FIG. 5

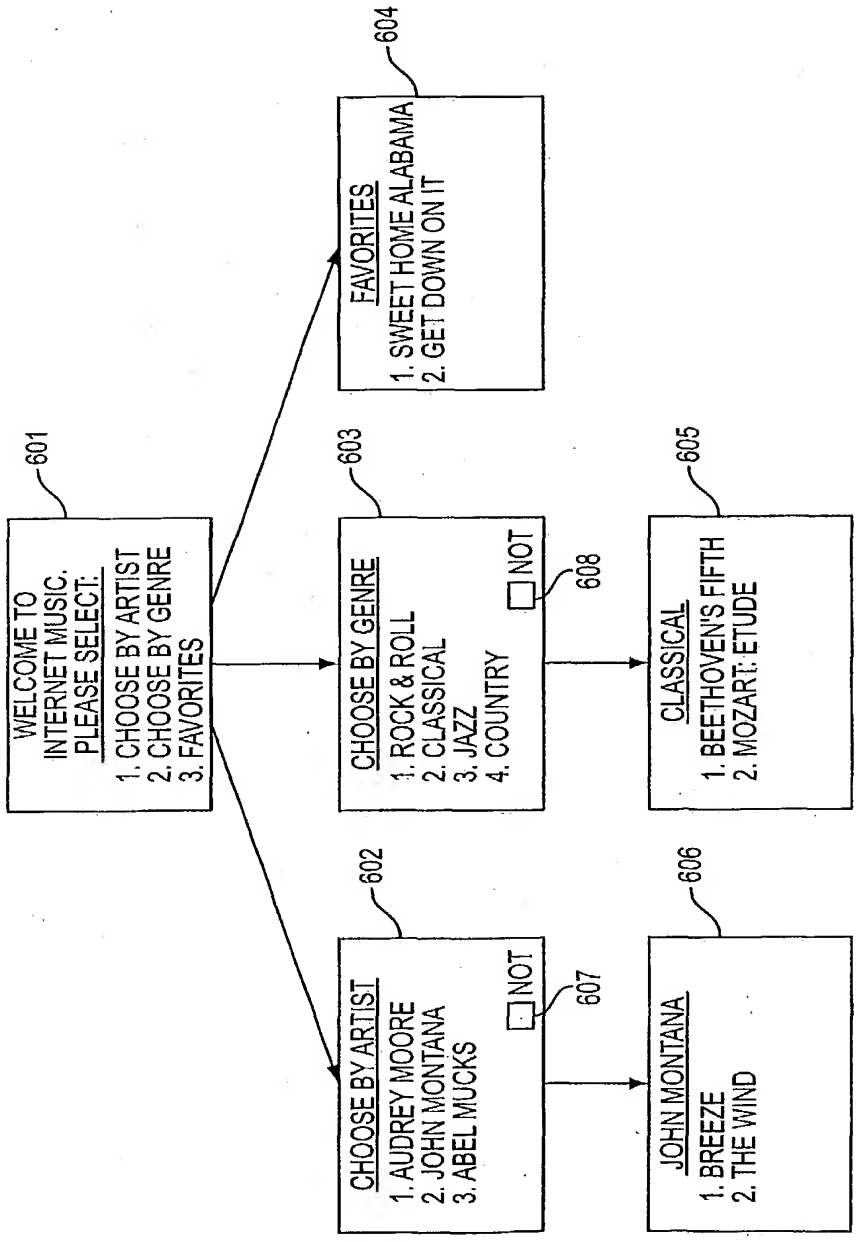
601
WELCOME TO INTERNET MUSIC. PLEASE SELECT:
1. CHOOSE BY ARTIST
2. CHOOSE BY GENRE
3. FAVORITES
602
CHOOSE BY ARTIST
1. AUDREY MOORE
2. JOHN MONTANA
3. ABEL MUCKS
NOT
607
606
JOHN MONTANA
1. BREEZE
2. THE WIND
603
CHOOSE BY GENRE
1. ROCK & ROLL
2. CLASSICAL
3. JAZZ
4. COUNTRY
NOT
608
605
CLASSICAL
1. BEETHOVEN'S FIFTH
2. MOZART: ETUDE
604
FAVORITES
1. SWEET HOME ALABAMA
2. GET DOWN ON IT

FIG. 6